DASG-PPM-NC 23 October 2001

INFORMATION PAPER

SUBJECT: Clinical Features of Anthrax Infection in Humans.

1. Purpose. In light of the rapidly evolving outbreak of anthrax in the United States, Army health care providers must be aware and remain vigilant concerning the various clinical presentations of anthrax to ensure early diagnosis and timely treatment. This information supplements the guidance issued by The Surgeon General on 16 Oct 01 (ref 2.e.).

2. References.

a. US Army Medical Research Institute of Infectious Diseases. Medical Management of Biological Casualties, 4th ed. 2001 Feb (http://www.usamriid.army.mil/education/bluebook.html).

b. FM 4-02.33. Control of Communicable Diseases Manual. 17th Edition. Feb 2000.

c. CDC Health Advisory: How To Handle Anthrax And Other Biological Agent Threats, Available at http://www.bt.cdc.gov.

d. Inglesby TF, Henderson DA, Bartlett JG, et al. Anthrax as a biological weapon: medical and public health management. JAMA 1999;281:1735-1745.

e. Memorandum, MCHO-CL, 16 Oct 01, Subject: Management of Patients with Potential Exposure to Anthrax Spores.

3. Epidemiology. Anthrax is a disease caused by the spore-forming bacterium *Bacillus anthracis*. Anthrax is a natural infection of grazing mammals. Spores can persist in the environment for years. Spores infect humans through breaks in the skin, through ingestion and through inhalation into the lungs. The incubation period for anthrax is 1-6 days, although much longer incubation periods are thought to be possible.

4. Clinical Presentation. Anthrax is an illness with acute onset characterized by several distinct clinical forms: inhalation, cutaneous, intestinal, oropharyngeal, and meningeal. Each of these clinical forms can progress to septicemia and multi-system infection in humans.

5. Symptoms, signs, and other findings.

a. Inhalational anthrax.

(1) Symptoms. Typically begins with a brief prodrome resembling a viral respiratory illness (fever, malaise, fatigue, cough, and mild chest discomfort) rapidly followed by development of severe respiratory distress with dyspnea, diaphoresis, stridor, and cyanosis. Shock and death occur within 24-36 hours after the onset of severe symptoms.

(2) Signs. During the prodrome, physical findings are typically non-specific.

(3) Other findings. Progressive hypoxia can be demonstrated during the phase of respiratory distress. A widened mediastinum is sometimes seen on x-ray late in the course of

illness, and correlates with a pathologic finding of hemorrhagic mediastinitis, the “classic” presentation of inhalational anthrax.

b. Cutaneous anthrax.

(1) Symptoms. Patient presents complaining of a painless or perhaps pruritic skin lesion, usually on the head, neck, forearm, or hand. Some patients may have constitutional symptoms of systemic illness associated with regional anatomic involvement. Late in the course, patient may develop sepsis, leading to death in up to 20% of untreated individuals.

(2) Signs. Physical exam reveals a solitary skin lesion that begins as a pruritic papule or macule and evolves into a round ulcer by the second day. Subsequently, small (1 to 3 mm) vesicles can appear which may produce a clear fluid. Within a few days, the lesion progresses to a painless, depressed, black eschar that is often surrounded by edema. The eschar will dry and fall often within 1 or 2 weeks. Regional symptoms (lymphangitis, lymphadenopathy) are usually accompanied by systemic symptoms.

(3) Other findings. Gram stain of fluid from vesicular lesions can demonstrate characteristic organisms.

c. Intestinal.

(1) Symptoms. Deposition of spores in the lower gastro-intestinal tract can lead to nausea, vomiting, and malaise. This can rapidly progress to bloody diarrhea, abdominal pain, or symptoms of sepsis. Some individuals will develop a swollen abdomen.

(2) Signs. Physical exam may demonstrate an acute abdomen, the presence of ascites, and the presence of blood in the stool. Advanced disease may be characterized by signs of sepsis.

d. Oropharyngeal.

(1) Symptoms. Patient will present complaining of a lesion in the mouth or soreness in the throat (esophageal). This may be accompanied by fever.

(2) Signs. Physical exam may identify an oral ulcer with associated regional lymphadenopathy and edema. Alternatively, tenderness may be localized to the throat (esophageal region).

(3) Endoscopy may demonstrate the presence of an esophageal ulcer.

e. A meningeal form of the disease can present as acute onset of high fever with meningismus, frequently with convulsions and loss of consciousness. Alternatively, this form of the disease can follow after onset of one of the other forms.

COL DeFraites/DSN 761-3146.

Approved by COL Thresher